

A contribution to the study of the spiders (Araneae) in Sushtinska Sredna Gora Mountains, Bulgaria

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Introduction

No detailed study of spiders in Sushtinska Sredna Gora Mountains has been published so far. DRENSKY (1913; 1936), JURINITCH & DRENSKY (1917) announces about 54 species, but they were collected mainly around the towns of Klissura and Koprivshtitsa.

Area, material and method of study

Sushtinska Sredna Gora Mountains stretches east-west between the defiles of the rivers Topolnitsa and Stryama along 80 km. A considerable part of the main chain has an altitude of more than 1000 m.

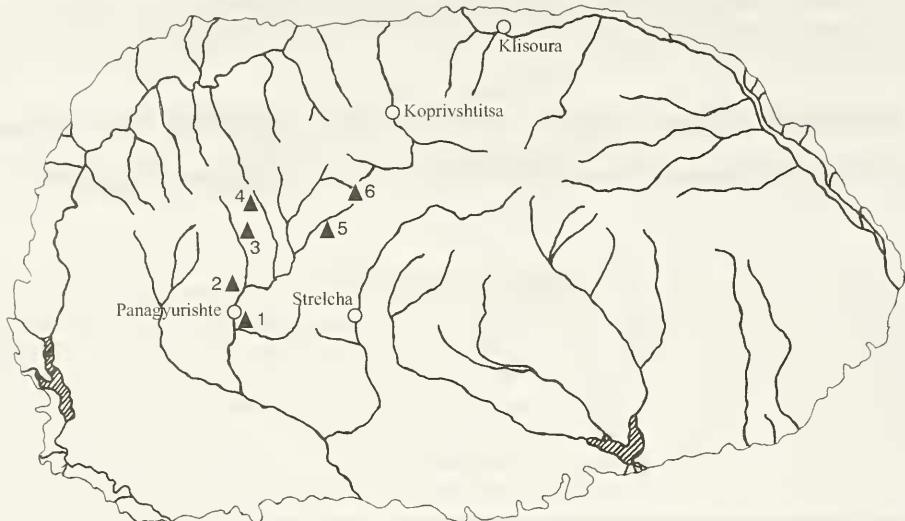
The following vegetation belts are found in Sushtinska Sredna Gora Mts: an oak-hornbeam forest belt (*Quercus dalechampii*, *Carpinus betulus*); a xerotherm oak forest belt (*Quercus cerris*, *Quercus frainetto*); a beech forest belt (*Fagus sylvatica*).

Sushtinska Sredna Gora Mts falls within the sub-continental climate zone.

The present study is a result of collecting and processing of original materials and observations in the period from 23 April 1993 to 10 September 1994. The study included route and stationary methods, with more than 30 excursions being made. A variety of methods were used: pit-fall traps, netting and manual collection (Map 1).

Results and discussion

116 species of 23 families were found: Pholcidae - 1; Dysderidae - 2; Eresidae - 1; Theridiidae - 9; Linyphiidae - 8; Tetragnathidae - 3; Araneidae - 4; Lycosidae - 18; Pisauridae - 1; Agelenidae - 7; Dictynidae - 1; Amaurobiidae - 1; Titanoecidae - 1;



Map 1. Sushtinska Sredna Gora Mountains

Localities: 1 - Panagyurishte, 2 - Geshenka, 3 - Fetentsi, 4 - Panagyurski Kolonii Village, 5 - Rogochovets, 6 - Bunaya Peak

Oxyopidae - 2; Liocranidae - 3; Corinnidae - 1; Zodaridae - 1; Gnaphosidae - 17; Zoridae - 3; Heteropodidae - 1; Philodromidae - 7; Thomisidae - 11; Salticidae - 12 (Table 1). Most numerous among the species that were found are the individuals of the following families: Lycosidae (18) - 15.52%, Gnaphosidae (17) - 14.66%, Salticidae (12) - 10.34%, Thomisidae (11) - 9.48%; Theridiidae (9) - 7.76%, Linyphiidae (8) - 6.90%. The *Pardosa* genus is the most numerous one with 8 species.

Of the 116 species found, 101 are new for the region, and 1 - *Philodromus buxi* is new for the araneofauna of Bulgaria.

The finding of *Steatoda meridionalis* should be noted; until then it had been known only from the region of Kresna (DRENSKY, 1936). Its occurrence in Sushtinska Sredna Gora Mts means that this species has a wider distribution in Bulgaria and its range is considerably expanding to the north. The same is true of the *Alopecosa sulzeri* species, which had been found only in Southern Bulgaria. An interesting species is also *Arctosa figurata*, found only once in Bulgaria until now (DRENSKY, 1936). This species, however, is not present in Drensky's collection (DELTSHEV & BLAGOEV, 1995). The occurrence of this species confirms its existence in Bulgaria and its distribution in the central part of the country. A similar finding is that of the *Gnaphosa modestior* species which had been announced only once from Dragoman (DRENSKY, 1936). *Ceto laticeps* had been known only from Zemen. Finding it in the studied region speaks of the expansion of its range too.

The majority of species are distributed in the meadow (53) and the meadow-forest (40) biotopes (Table 1 and Fig. 1).

The zoogeographic classification of the spiders in Sushtinska Sredna Gora Mts

Table 1

Species composition and distribution of the spiders in Sushtinska Sredna Gora Mountains

Biotopes: B1 - meadow; B2 - forest; B3 - meadow - forest; B4 - synantrope; B5 - marshes and river valleys; **Complexes:** M - Mediterranean; NM - North Mediterranean; EE - East European; P - Palearctic; H - Holarctic; WP - West Palearctic; E - European; MSE - Middle South European; MEE - Middle East European; MSEE - Middle Southeast European; BG - Bulgarian

* New for Sushtinska Sredna Gora Mountains; ** New for Bulgaria

species	B1	B2	B3	B4	B5	zoogeographic categories	
	1	2	3	4	5		
PHOLCIDAE							
<i>Holocnemus pluchei</i> (Scopoli) *					+		M
DYSDERIDAE							
<i>Dysdera longirostris</i> Doblica *					+		EE
<i>Harpactea babori</i> Nocek					+		NM
ERESIDAE							
<i>Eresus cinnabarinus</i> (Olivier) *							P
THERIDIIDAE							
<i>Crustulina sticta</i> (O. P. Cambridge) *		+					H
<i>Dipoena prope melanogaster</i> (C. L. Koch) *					+		WP
<i>Enoplognata thoracica</i> (Hahn) *		+					H
<i>Enoplognatha latimana</i> Hippa & Oksala *		+					H
<i>Euryopis flavomaculata</i> (C. L. Koch) *		+					P
<i>Robertus mediterraneus</i> Escov *		+					M
<i>Steatoda castanea</i> (Clerck) *					+		E
<i>Steatoda meridionalis</i> (Kulczynski) *					+		EE
<i>Theridion betteni</i> Wienle *		+					P
LINYPHIIDAE							
<i>Ceratinella scabrosa</i> (O. P. Cambridge) *		+					E
<i>Drapetisca socialis</i> (Sundevall) *			+				P
<i>Frontinellina frutetorum</i> (C. L. Koch)		+					WP
<i>Lepthyphantes leprosus</i> (Ohlert)		+					H
<i>Linyphia hortensis</i> Sundevall *		+					E
<i>Microneta viaria</i> (Blackwall) *		+					H
<i>Neriene furtiva</i> (O. P. Cambridge) *		+					WP
<i>Trichoncus affinis</i> Kulczynski *		+					E
TETRAGNATHIDAE							
<i>Metellina segmentata</i> (Clerck) *		+					P
<i>Pachygnata degeeri</i> Sundevall					+		P
<i>Tetragnatha extensa</i> (Linne) *					+		H
ARANEIDAE							
<i>Araneus angulatus</i> Clerck			+				P
<i>Araneus diadematus</i> Clerck *			+				H
<i>Mangora acalypha</i> (Walckenaer)			+				P
<i>Neoscona adianta</i> (Walckenaer)			+				P
LYCOSIDAE							
<i>Alopecosa accentuata</i> (Latreille) *			+				P

Table 1 (continuation)

1	2	3	4	5	6	7
<i>Alopecosa cuneata</i> (Clerck) *			+			P
<i>Alopecosa pinetorum</i> (Thorell) *			+			P
<i>Alopecosa sulzeri</i> (Pavesi) *			+			P
<i>Arctosa figurata</i> (Simon) *			+			P
<i>Aulonia albimana</i> (Walckenaer) *			+			E
<i>Lycosa radiata</i> (Latreille) *			+			P
<i>Pardosa agrestis</i> (Westring) *			+			P
<i>Pardosa agricola</i> (Thorell) *				+		E
<i>Pardosa alacris</i> (C. L. Koch) *			+			E
<i>Pardosa albatula</i> (L. Koch)			+			MSE
<i>Pardosa amentata</i> (Clerck) *				+		E
<i>Pardosa bifasciata</i> (C. L. Koch) *	+					E
<i>Pardosa hortensis</i> (Thorell) *			+			E
<i>Pardosa lugubris</i> (Walckenaer)			+			P
<i>Trochosa terricola</i> Thorell *			+			H
<i>Xerolycosa miniata</i> (C. L. Koch) *	+					P
<i>Xerolycosa nemoralis</i> (Westring) *	+					P
PISAURIDAE						
<i>Pysaura mirabilis</i> (Clerck) *			+			P
AGELENIDAE						
<i>Agelena gracilens</i> C. L. Koch			+			M
<i>Tegenaria campestris</i> C. L. Koch	+					E
<i>Tegenaria ferruginea</i> (Panzer) *	+					E
<i>Tegenaria nemorosa</i> Simon *			+			NM
<i>Tegenaria parietina</i> (Fourcroy) *				+		WP
DICTYNIDAE						
<i>Nigma walckenaeri</i> (Roewer) *			+			H
AMAUBOIIDAE						
<i>Amaurobius pallidus</i> L. Koch *			+			MEE
<i>Celotes falciger</i> Kulczynski *			+			EE
<i>Celotes jurinitschi</i> (Drensky)*			+			BG
TITANOECIDAE						
<i>Titanoeca quadriguttata</i> (Hahn)	+					P
OXYOPIDAE						
<i>Oxyopes heterophthalmus</i> Latreille *	+					P
<i>Oxyopes lineatus</i> Latreille *	+					P
LIOCRANIDAE						
<i>Agroeca pullata</i> Thorell *			+			E
<i>Liocranum rupicola</i> (Walckenaer) *			+			E
<i>Liocranum rutilans</i> (Torell) *			+			E
CORINNIDAE						
<i>Ceto laticeps</i> (Canestrini) *	+					E
ZODARIIDAE						
<i>Zodarion pirtini</i> Drensky *			+			BG
GNAPHOSIDAE						
<i>Berlandina cinerea</i> (Menge) *	+					E
<i>Callilepis nocturna</i> (Linne) *	+					P

Table 1 (continuation)

1	2	3	4	5	6	7
<i>Drassodes lapidosus</i> (Walckenaer) *			+			P
<i>Drassodes pubescens</i> (Thorell) *			+			P
<i>Gnaphosa lucifuga</i> (Walckenaer) *	+					P
<i>Gnaphosa modestior</i> (Kulczynski) *			+			EE
<i>Haplodrassus dalmatinus</i> (Sundevall) *			+			E
<i>Haplodrassus signifer</i> (C. L. Koch) *		+				H
<i>Haplodrassus silvestris</i> (Blackwall) *		+				E
<i>Micaria fulgens</i> (Walckenaer) *		+				WP
<i>Micaria romana</i> L. Koch *		+				P
<i>Zelotes apricorum</i> (L. Koch) *			+			E
<i>Zelotes electus</i> (C. L. Koch) *			+			E
<i>Zelotes erebeus</i> (Thorell) *			+			E
<i>Zelotes hermani</i> (Chyzer) *			+			EE
<i>Zelotes praeficus</i> (L. Koch) *	+					E
<i>Zelotes villicus</i> (Thorell) *		+				MSEE
ZORIDAE						
<i>Zora nemoralis</i> (Blackwall) *			+			P
<i>Zora pardalis</i> Simon *			+			E
<i>Zora spinimana</i> (Sundevall) *			+			P
HETEROPODIDAE						
<i>Micrommata virescens</i> (Clerck) *		+				P
PHILODROMIDAE						
<i>Philodromus buxi</i> Simon **		+				E
<i>Philodromus cespitum</i> (Walckenaer) *		+				H
<i>Philodromus dispar</i> (Walckenaer) *		+				E
<i>Thanatus arenarius</i> Torell *		+				MEE
<i>Thanatus formicinus</i> (Clerck)		+				H
<i>Thanatus vulgaris</i> Simon *		+				H
<i>Tibellus oblongus</i> (Walckenaer) *		+				H
THOMISIDAE						
<i>Misumena vatia</i> (Clerck)		+				H
<i>Ozyptila atomaria</i> (Panzer) *		+				P
<i>Runcinia lateralis</i> C. L. Koch *		+				P
<i>Thomisus onustus</i> Walckenaer *		+				P
<i>Xysticus bifasciatus</i> (C. L. Koch) *		+				E
<i>Xysticus cristatus</i> (Clerck)		+				P
<i>Xysticus erraticus</i> (Blackwall) *		+				E
<i>Xysticus gallicus</i> Simon *		+				P
<i>Xysticus kochi</i> Torell *		+				P
<i>Xysticus lanio</i> C. L. Koch *		+				P
<i>Xysticus luctator</i> L. Koch *			+			P
<i>Xysticus ninnii</i> Thorell *			+			P
SALTICIDAE						
<i>Euophrys obsoleta</i> (Simon) *		+				P
<i>Evarcha arcuata</i> (Clerck)		+				P
<i>Evarcha flammata</i> (Clerck) *		+				H
<i>Evarcha laetabunda</i> (C. L. Koch) *			+			P

Table 1 (continuation)

	1	2	3	4	5	6	7
<i>Heliophanus auratus</i> C. L. Koch *		+					P
<i>Heliophanus cupreus</i> (Walckenaer) *			+				P
<i>Heliophanus kochi</i> (Simon) *				+			P
<i>Pelenes nigrociliatus</i> (L. Koch) *		+					P
<i>Pelenes tripunctatus</i> (Waickenaer)				+			P
<i>Philaeus chrysops</i> (Poda) *		+					P
<i>Phlegra fasciata</i> (Hahn) *		+					P
<i>Salicus scenicus</i> (Clerck) *		+					H

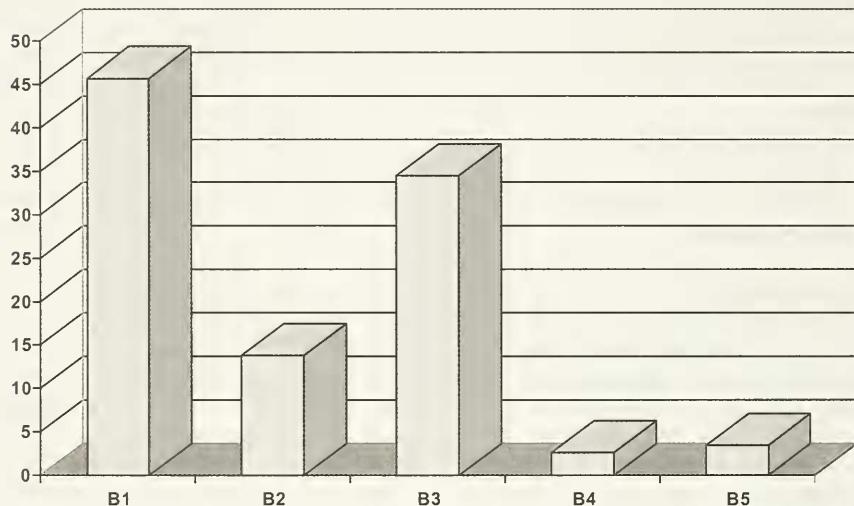


Fig. 1. Distribution of the spider species in biotopes in Sushtinska Sredna Gora Mountains
 B1 - meadow; B2 - forest; B3 - meadow - forest; B4 - synantrope; B5 - marshes and river valleys

has been made on the basis of literature data reflecting their current distribution (PLATNICK, 1993) (Table 1 and Fig. 2).

The spiders of Sushtinska Sredna Gora Mts can be classified in 11 zoogeographic categories, grouped into three complexes (Fig. 2). The first complex includes the species (72, 62%) with the widest ranges (H + P + WP). It is dominated by Palearctic species (50 or 43.1%). Most numerous of them are: *Aulonia albimana*, *Xerolycosa nemoralis* and *Pisaura mirabilis*. Then follow the Holarctic species (17 or 14.7%) and the Western Palearctic species (5 or 4.3%).

The second complex includes the European species (39 or 33.6%), (E + MEE + MSE + MSEE + EE + BG). Most numerous are the species occurring all over Europe (28 or 24.1%). The rest of the categories are represented by single

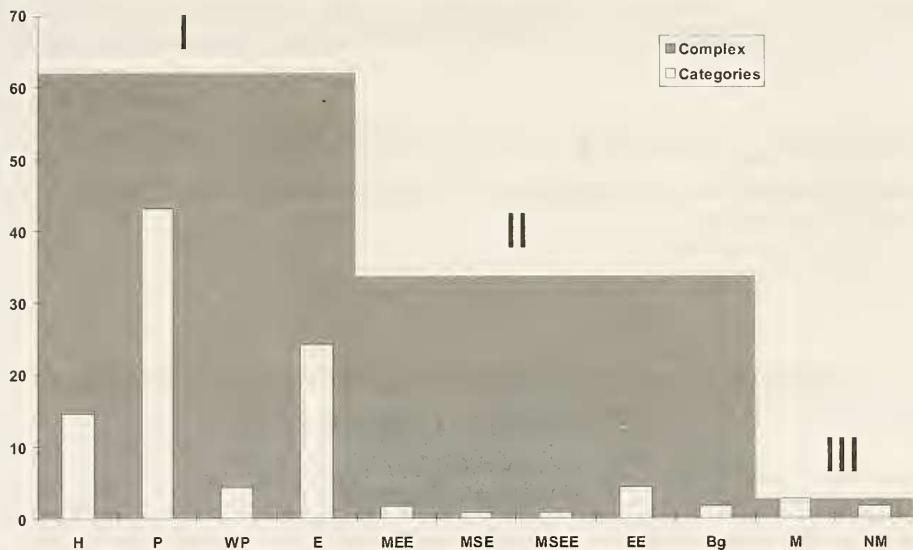


Fig. 2. Distribution of the spider species in Sushtinska Sredna Gora Mountains in zoogeographical categories and complexes

Category: M - Mediterranean; NM - North Mediterranean; EE - East European; P - Palearctic; H - Holarctic; WP - West Palearctic; E - European; MSE - Middle South European; MEE - Middle East European; MSEE - Middle Southeast European; BG - Bulgarian

Complex: I - Holarctic, II - European, III - Mediterranean

species. Most characteristic of the whole complex are: *Dysdera longirostris*, *Steatoda meridionalis*, *Pardosa bifasciata*, *Celotes jurinitschi* and *Zodarion pirini*.

The Mediterranean complex (M + NM) includes 3 (2.6%) species distributed across the whole Mediterranean area and 2 (1.7%) species known from its northern parts.

The outline of the araneofauna in Sushtinska Sredna Gora Mts is determined by the Palearctic and European species, while the endemites *Celotes jurinitschi* and *Zodarion pirini* appear as local elements.

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Received on 10.2.1998

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Принос към изучаването на паяците (Araneae) в Същинска Средна гора

Стоян ЛАЗАРОВ

(Резюме)

Аранеофауната на Същинска Средна гора не е детайлно проучена. При настоящото изследване са установени 116 вида от 23 семейства, като 101 от тях са нови за изследвания район, а 1 (*Philodromus vixi*) е нов за аранеофауната на България. Най-добре са представени семействата Lycosidae (18 вида - 15.52%), Gnaphosidae (17 вида - 14.66%) и Salticidae (12 вида - 10.34%), като най-много видове насят ливадните и ливадно-горските биоморфии. Зоогеографската класификация е направена по съвременни данни за разпространението на видовете и включва 11 групи, обединени в 3 комплекса: холарктичен, европейски и медитерански. Обликът на аранеофауната в Същинска Средна гора се определя от палеарктичните и европейските видове, а локалният характер - от ендемитите и югоизточно-европейските елементи.